

Report Title

Author Name

January 15, 2009

Abstract

The abstract is a short description of your work. In a few lines of text you should be able to summarise the work that you are describing, along with the main results, and any significant conclusions that you have reached.

Contents

1	Introduction	3
2	Making Sections	3
3	References	3
4	Equations	3
4.1	Mathematical symbols and Greek lettering	4
5	Figures	4
6	Tables	5
7	Style and formatting	6

1 Introduction

This is an example L^AT_EX file. The source file shows the latex commands used in order to create the pdf example report that you are reading. You should read this report file in parallel with the tex that was used to create it.

2 Making Sections

You can make a new section in latex by using the `\section{section heading}` command. For example `\section{Introduction}` was used to make the introduction. In a similar way, sub and sub-sub section headings are obtained.

3 References

One of the ways of citing work using latex is illustrated in this example. This is through the `\cite{bibitem key name}` command. More information on the use of L^AT_EX can be found at the L^AT_EX Project Web Site [1], or by doing a web search. If you make more citations in your report, for example L. Landau [2], and the LHC [3], the reference numbers are automatically incremented at the end of the document. The order of your reference numbers depends on the order in which the `\bibitem` commands appear in the bibliography.

4 Equations

There are two ways to include single-line equations in L^AT_EX. The simplest method is to surround the equation by double dollar signs. This will produce an equation that does not have numbering by default and is aligned in the centre of the page. For example

$$\mathcal{P}(x; \gamma) = e^{\gamma x},$$

is the equation for an exponential function. The latex used to produce this is

```
$$  
{\cal{P}}(x; \gamma) = e^{\gamma x},  
$$
```

Another way to obtain a single line equation is to use the equation environment:

$$\mathcal{P}(x; \gamma) = e^{\gamma x}, \tag{1}$$

where the equation now has a number. There is also a label on this equation so we can refer to this as Eq. (1) in the text and L^AT_EX will substitute the correct equation number into the text. The L^AT_EX required to produce this equation is shown in the following:

```

\begin{equation}
{\cal P}(x; \gamma) = e \wedge \{\gamma x\}, \label{myeqn}
\end{equation}

```

Sometimes we need to have a multiline equations. Either a long equation broken over more than one line, or several related equations written down within a common block of L^AT_EX. These multiline equations are made using the eqnarray environment as shown below

$$\begin{aligned} \mathcal{P}(x; p_i) = & f_{core}G_{core}(x, \sigma(x), \mu_{core}, \sigma_{core}) + f_{tail}G_{tail}(x, \sigma(x), \mu_{tail}, \sigma_{tail}) \\ & + (1 - f_{core} - f_{tail})G_{outlier}(x, \mu_{outlier}, \sigma_{outlier}). \end{aligned} \quad (2)$$

4.1 Mathematical symbols and Greek lettering

As you will see in the preceeding, the L^AT_EX commands for greek letters are the name of the letter preceded by a \. In order to correctly reproduce a greek letter, you will need to place the latex command in a mathmode environment. Such environments are described above with respect to equations, however you can have an in-line mathmode environment by enclosing your latex commands with dollar signs. For example $\alpha\beta\gamma$ is reproduced as $\alpha\beta\gamma$.

There are a number of pre-defined symbols that are useful, such as \hbar which produces \hbar , and it is possible to underline or overline a letter such as \underline{b} , \overline{b} with \underline{b} , \overline{b} and \overline{b} .

A full list of math symbols can be found in Ref. [4].

5 Figures

Figure 1 shows an imported figure. The imported figure is an eps (Encapsulated Postscript) file. Figures should always have

- A caption. This should appear below the figure.
- Axis labels. It is unacceptable to omit axis labels, and to do so will result in marks being taken off of any work you submit. The units (if any) should be indicated on the axis labels.

- The text and numbers on a figure should be readable.
- If the caption refers to lines on points on the figure, it should do so by style, not colour. That way your report remains readable when printed on a black and white printer.

Your figure should also be referred to in the text surrounding it. Normally the figure will appear just after it has been referred to.

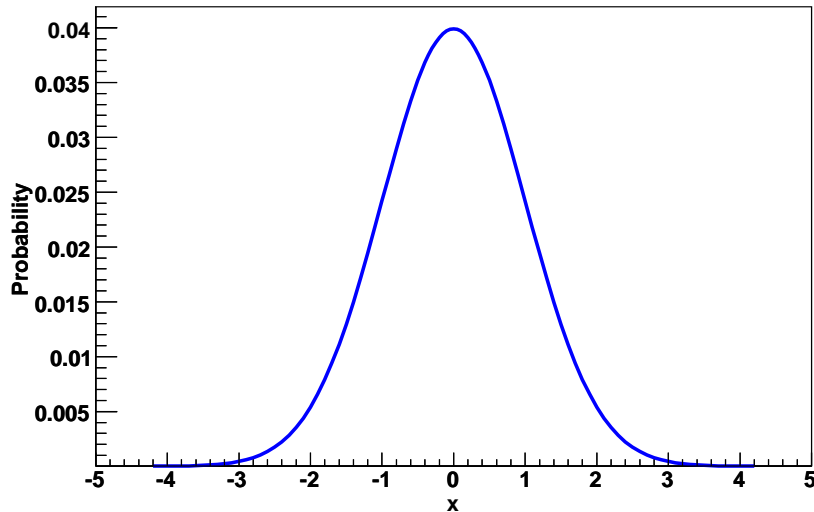


Figure 1: An example of the Gaussian function shape, normalised to unit area. The un-normalised Gaussian function is given in Eq. (1).

6 Tables

Table 1 shows a table in \LaTeX .

Table 1: The masses and lifetimes of several unstable particles.

Particle	Mass (MeV/c^2)	Lifetime (s)
μ	105.658367 ± 0.000004	$(2.197019 \pm 0.000021) \times 10^{-6}$
π^0	134.9766 ± 0.0006	$(8.4 \pm 0.6) \times 10^{-17}$
π^\pm	139.57018 ± 0.00035	$(2.6033 \pm 0.0005) \times 10^{-8}$

Normally table captions appear above the table, and as with figures, the tables are referred to in the text before they appear in the document.

7 Style and formatting

The Student handbook has information on style and formatting for projects [5]. More formal guides are available that give formatting advice for journal publications. Particularly keen students might also like to refer to the American Institute for Physical journal publication style guide [6].

References

- [1] <http://www.latex-project.org/>
- [2] L. Landau, J. Phys. USSR **8** (1944) 201; see also W. Allison and J. Cobb, Ann. Rev. Nucl. Part. Sci. **30** (1980) 253.
- [3] The Large Hadron Collider at CERN. The LHC web page can be found at <http://lhc.web.cern.ch/lhc/>.
- [4] <http://www.ctan.org/tex-archive/info/symbols/comprehensive/symbols-a4.pdf>
- [5] <http://www.ph.qmul.ac.uk/stuhbk/guidelines.php>.
- [6] http://www.aip.org/pubservs/style/4thed/AIP_Style_4thed.pdf.